INTERACTION OF APPLICATION FACTORS AND TIME OF DAY ON COMMON WATERHEMP AND PALMER AMARANTH CONTROL WITH GLYPHOSATE. Sean D. Nettleton and Bryan G. Young, Graduate Research Assistant, Associate Professor, Department of Plant, Soil, and Agricultural Systems, Southern Illinois University, Carbondale, IL 62901.

Variable control of common waterhemp with glyphosate has been observed in commercial applications. Two field research studies were conducted near Ina, Illinois in 2004 to determine the extent of variability in glyphosate efficacy that can be attributed to specific herbicide application parameters.

The first study investigated the interaction of carrier volume and application travel speed with two spray nozzle types. Glyphosate was applied by a factorial arrangement of application parameters that consisted of: nozzle type (XR Teejet and AI Teejet), carrier volume (47, 94, 140 and 187 L/ha), and application travel speed (8, 16, 24, and 32 km/h). No differences were observed for control of common waterhemp for any combination of carrier volume or travel speed with the AI nozzles. However, control of common waterhemp with the XR nozzles was greater at 94 L/ha compared with 47, 140, and 187 L/ha. When glyphosate was applied in 187 L/ha, control of common waterhemp was 8% less with the AI nozzles compared to the XR nozzles.

The second study for glyphosate applications utilized a factorial arrangement with carrier volume (47 and 187 L/ha), application travel speed (8 and 32 km/h), and two nozzle types (XR Teejet and AI Teejet), applied at three different times of day (7:00 am, 1:00 pm, and 7:00 pm). Common waterhemp control at 7:00 am was reduced 13% when glyphosate was applied in 187 L/ha compared with 47 L/ha. There was no difference in control of common waterhemp between carrier volumes when glyphosate applications were made at 1:00 pm. Similar to 7:00 am, control of common waterhemp at 7:00 pm was reduced by 6% when glyphosate was applied in 187 L/ha compared with 47 L/ha. There was also an interaction between application time of day and nozzle type. The AI nozzles provided at least10% less control of common waterhemp than any other nozzle and time of day combination.

The efficacy of glyphosate on Palmer amaranth was similar for all glyphosate application methods tested in each study. Palmer amaranth was generally more sensitive to glyphosate than common waterhemp.

2004 North Central Weed Science Proceedings 59:43.